

# FLORA OF MONOMOY ISLAND, MASSACHUSETTS

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The flora of Monomoy Island, Massachusetts, has been investigated during the summers of 1965, 1966, and 1967 in July and August as part of the Systematics-Ecology Program of the Marine Laboratory at Woods Hole. This is part of the survey of the plants of the marine fringe being made for the Cape Cod area under that program.

Monomoy Island is a large mass of sand, one-quarter to one mile wide, built up by shore-drifting from the northern shores of the Cape. It extends into Nantucket Sound for 8 miles, south of Chatham. At present it is under the administration of the Bureau of Sport Fisheries and Wildlife and is reserved as a Wild Life Refuge. The island is built up of a number of curving sand ridges which have become connected by wind-formed dunes. Several natural fresh water ponds and marshes have developed in the hollow of some of the dunes. A number of artificial ponds have been dug by the Bureau of Wildlife to provide food and resting places for migratory wild fowl.

The survey of the island was made by a group of associates from the Systematics-Ecology Program from the laboratory, including Mr. Peter Schwamb, curator of the Gray Museum. We were assisted by Mr. Dana Eldridge, a native of Orleans, Massachusetts. Three areas were covered as completely as possible by doubling back and forth across the island. Herbarium specimens were collected and deposited in the Herbarium of the Gray Museum at the Marine Laboratory, with duplicates placed in the Chrysler Herbarium at Rutgers, The State University, New Jersey.

The areas surveyed were as follows: Area #1 at the southern tip of the island, known as Monomoy Point, around Big Station Pond and Powder Hole. This is an area of dunes, brackish ponds, and fresh water marshes; Area

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#2 was north of this around the Old Monomoy Light Tower and the abandoned Coast Guard Station; Area #3 was at Inward Point and around Hospital Pond. North of Inward Point the island is completely covered with typical dune vegetation.

The flora of islands change over the years. Examination of the records of the flora of Penikese Island (Jordan 1874, Lewis 1924, Fogg 1930, Moul 1948, Moul 1961) will show some drastic changes over the years. So the list of species presented here should be considered the summer flora of Monomoy Island at the present time. A number of plants reported for Monomoy Island by S. G. Cross and C. E. Cross in 1954 (unpublished list provided by Mrs. Marcia G. Norman) were not found. Some of the plants included in this 1954 list are possible misidentifications, since a number of them do not occur in the range of Gray's Manual. *Arctostaphylos uva-ursi*, *Kalmia angustifolia* and *Chrysanthemum leucanthemum* listed as present by Cross and Cross cannot be conspicuous members of the flora, since they were not found even after extensive search in 1967. Moul noted (1961) that *Chrysanthemum leucanthemum*, formerly common on Penikese Island has become extremely rare.

The dominant vegetation type of the island is the dune grass community (*Ammophila breviligulata*) on the primary dunes. With the grass are the usual associates *Lathyrus japonicus*, *Solidago sempervirens*, and *Xanthium echinatum*. This community occupies the whole northern end of the island and the east and west shores. The secondary dunes have dune grass on them, but are principally covered with a *Hudsonia-Cladonia* association. *Artemisia caudata*, *Chrysopsis falcata*, and *Lechea maritima* are commonly associated with *Hudsonia*. These secondary dune communities are very extensive in the Inward Point area and the area around the Monomoy Light Tower. The inner dunes at Monomoy Point (area #1) are covered with a growth of *Ammophila* and *Phragmites communis*. Thickets typical of the main Cape, consisting of *Myrica pensylvanica*, *Rosa rugosa*, *Prunus maritima*, and *Rhus radicans*, occur in the protected hollows and slopes of the inner dunes.



Beach vegetation on the Nantucket Sound or west coast of the island is typical of the Cape beaches. *Cakile edentula*, *Xanthium echinatum*, *Lathyrus japonicus*, and *Atriplex arenaria* are the principal plants of the association. This community is missing on the east or ocean shore.

Extensive cat-tail (*Typha*) marshes occur north of Big Station Pond at Monomoy Point (area #1). *Typha angustifolia* forms a dense phalanx, beneath which grows *Galium palustre*, *Ptilimnium capillaceum*, and *Pluchea purpurascens* in dense stands. The waterways, probably made by muskrats, are filled with *Ludwigia palustris*.

The wet depressions at Monomoy Point and the Lighthouse area have *Festuca rubra* and *Spartina patens* in them. The other species associated with the grasses are *Polygonum* spp., *Rumex crispus*, *Lycopus americanus*, *Scutellaria epilobiifolia*, *Teucrium canadense*, and *Iris versicolor*. This type of vegetation is also found along the shores of the many artificial ponds. Cat-tails and *Onoclea sensibilis* also occur along the shores of some of these ponds. The sand removed in digging the ponds has been piled into artificial dunes, which are now covered with *Rhus radicans*, *Myrica pensylvanica* and *Prunus maritima*.

In the center of the island at area #2 are a few small thickets made up of *Salix discolor*, *Amelanchier laevis*, *Vaccinium corymbosum*, and *Prunus serotina*, with dense margins of *Myrica pensylvanica*. A few *Pinus rigida* grow in the protection of these thickets. The shrubs and trees here show wind pruning due to salt spray.

A number of bogs occur in depressions of the dunes in area #2. *Vaccinium macrocarpon* and *Sphagnum palustre* form the dense ground cover. *Viola lanceolata*, *Lycopodium inundatum*, *Drosera rotundifolia*, and *Pogonia ophioglossoides* grow in these bogs. *Polytrichum commune* occurs around the drier margins of the bogs.

The weedy species such as *Daucus carota*, *Phytolacca americana*, and *Achillea millefolium* are confined principally to the area of the lighthouse and abandoned Coast Guard station, showing the influence of man.

The most mature vegetation occurs at Inward Point (area



#3). This part of the island has been used for years by summer visitors and a number of old cottages are located here. What probably was formerly a fresh water pond, and still may be flooded during wet summers, is dotted with hummocks of *Juncus effusus*. *Ptilimnium capillaceum*, *Hypericum virginicum*, *Osmunda cinnamomea*, and *Iris versicolor* form a dense cover in the wet bottom. A few patches of open water persist. *Dicranum scoparium* grows in the drier portions of the marsh along the border. The thicket surrounding this marsh is quite dense and contains most of the woody species reported for the island. *Vaccinium corymbosum* is very common, and in the summer of 1965 bore a prolific crop of berries, but had no fruit in 1966 or 1967. *Pinus sylvestris* has apparently been planted here in the thickets, and the trees have produced cones regularly.

The largest typical New England type salt marsh occurs north of Inward Point. It is dissected by creeks, and there are a number of dry "pannes" in which scattered *Salicornia* spp., and *Plantago oliganthos* grow. This marsh extends almost completely across the island and merges with the dune grass of the eastern dunes.

Nomenclature used in the list of higher plants is that of Fernald (1950). Nomenclature for the mosses is that of Grout (1940). The assistance of Dr. David Fairbrothers and Mary Hough in identification of a number of taxa is acknowledged.

#### LICHENS

*Cladonia sylvatica* (L.) Hoffm. Bare sandy areas on dunes, between vegetation. Areas #1, #2.

*Cladonia* sp. Between *Hudsonia* plants on dunes near center of island. Area #3.

#### BRYOPHYTES

*Dicranum scoparium* Hedw. Path around fresh water marsh in thickets. Area #3.

*Polytrichum commune* L. var. *perigoniale* (Mx.) Bry. Eur. Carpeting areas around edge of sphagnum-cranberry bogs. Area #2.

*Sphagnum palustre* L. In the bogs. Area #2.



## VASCULAR PLANTS

- Lycopodium inundatum* L. Fairly common in sphagnum bogs in the hollows of dunes in Area #2.
- Osmunda cinnamomea* L. Fresh water marsh in Area #3. Inward Point.
- Dryopteris thelypteris* (L.) Gray. var. *pubescens* (Lawson) Nakai. Commonest fern. Beneath cat-tails in Area #1. Also around artificial ponds and fresh water marshes in areas #2 and #3.
- Onoclea sensibilis* L. Fairly common. In cat-tail marsh, around artificial ponds and bogs in Areas #1 and #2.
- Juniperus virginiana* L. Small trees to 2 feet in height around abandoned lighthouse. Area #2.
- Pinus rigida* Mill. A few low scrubby trees in the center of the island, Area #2. Frequently protected by willow and shad-bush thickets.
- Pinus sylvestris* L. Planted around a fresh water marsh. In thickets. Cones present. Inward Point. Area #3.
- Typha angustifolia* L. Very common in low marshy area between dunes. Monomoy Point. Area #1.
- Ruppia maritima* L. In brackish water ponds near Monomoy Point. Covered with blue-green algae. Area #1.
- Triglochin maritima* L. In the *Spartina patens* zone of the salt marsh. Inward Point. Area #3.
- Agrostis alba* L. var. *palustris* (Huds.) Pers. Drier parts of the hollows between dunes and ponds. Area #1, and at the edge of salt marsh and dunes at Inward Point, area #3.
- Agrostis scabra* Willd. Shade of willow thicket. Center of island. Area #2.
- Ammophila breviligulata* Fern. Common grass of all dune areas.
- Bromus tectorum* L. Bare sandy spots in center of island near cottages. Inward Point. Area #2.
- Elymus virginicus* L. var. *halophilus* (Bickn.) Wieg. Very common at edge of salt marsh and dunes. Upper beach next to dunes. Inward Point. Area #2.
- Festuca rubra* L. Wet swale, area #1. Edge of cranberry bog, area #2.



- Panicum virgatum* L. Border of fresh water marsh and dunes, area #1. Dunes and marsh border, east side of island, area #3.
- Phragmites communis* Trin. Very common around brackish ponds, on dunes, and in swales. Monomoy Point, area #1.
- Spartina alterniflora* Loisel. Brackish pond, area #1. Salt marsh in area #3.
- Spartina patens* (Ait.) Muhl. Drier part of swale, area #1. Salt marsh in area #3.
- Carex comosa* Boott. Wet area in center of island, area #2.
- Carex longii* Mackenzie. Swale near brackish ponds. Fairly common at other places in the dunes, area #1.
- Cyperus grayii* Torr. Bare sandy area between *Hudsonia* dunes, area #1. Dunes on east side of island, Inward Point, area #3.
- Eleocharis halophila* Fern. & Brack. Swale on border of fresh water ponds, area #1.
- Eleocharis parvula* (R. & S.) Link. Edge of brackish ponds. Very common, area #1.
- Eriophorum virginicum* L. Wet area in hollow of dunes, area #2.
- Scirpus americanus* Pers. Swale, border of brackish ponds, area #1. Dune-marsh transition zone, east side of island. Inward Point, area #3.
- Scirpus cyperinus* (L.) Kunth. Marsh area north of brackish ponds, area #1. Wet thickets in middle of island, area #2.
- Juncus acuminatus* Michx. Wet area near brackish ponds, area #1.
- Juncus effusus* L. In fresh water marsh. Inward Point, area #3.
- Juncus gerardi* Loisel. Salt marsh. Inward Point, area #3.
- Juncus greenii* Oakes & Tuck. Wet area near brackish ponds, area #1. Sandy soil, hollow of dunes, area #2.
- Smilacina stellata* (L.) Desf. var. *crassa* Vict. Small plants. In path cut through thickets around fresh water marsh, area #3.



- Smilax rotundifolia* L. Tangle on shrubs of thickets, area #3.
- Iris versicolor* L. Around artificial ponds in area #2. In fresh-water marsh at Inward Point, area #3.
- Sisyrinchium angustifolium* Mill. Around fresh-water ponds, area #2.
- Pogonia ophioglossoides* (L.) Ker. In sphagnum-cranberry bog between dunes in area #2. Fruiting.
- Salix discolor* Muhl. Forming small thickets, center of island in area #2. Identified by David Fairbrothers.
- Myrica pensylvanica* Loisel. Very common in thickets, area #1. Also present in areas #2 and #3.
- Polygonum pensylvanicum* L. In swale, bordering brackish water ponds, area #1.
- Polygonum punctatum* Ell. var. *leptostachyum* (Meisn.) Small. Fairly common in swale bordering brackish ponds, area #1. Also bordering fresh-water ponds, center of island in area #2.
- Rumex acetosella* L. Beach in area #1. Path in thickets in area #3.
- Rumex crispus* L. Wet area back of dunes bordering brackish ponds in area #1.
- Rumex maritimus* L. var. *fueginus* (Phil.) Dusen. Small plants growing in belt around brackish pond, just above water level, area #1.
- Atriplex arenaria* Nutt. Beach vegetation, areas #1 and #3. Flowers and seeds.
- Atriplex patula* L. var. *hastata* (L.) Gray. Dominant in beach vegetation, area #1.
- Salicornia bigelovii* Torr. Bare areas in salt marsh, area #3.
- Salicornia europaea* L. Salt marsh. "Pannes" and in *S. patens* zone, area #3.
- Salicornia virginica* L. Salt marsh. "Pannes" and in *S. patens* zone, area #3.
- Suaeda maritima* (L.) Dumort. Edge of salt marsh, area #3.
- Salsola kali* L. Dominant on beach, area #1.



- Phytolacca americana* L. Around Monomoy Light Tower, area #2.
- Arenaria peploides* L. var. *robusta* Fern. Beach on ocean side, area #3.
- Dianthus armeria* L. In thickets of bayberry, between fresh-water marsh and dunes, area #1.
- Spergularia marina* (L.) Grisch. In sand at edge of brackish ponds in area #1. Bare area in salt marsh, area #3.
- Nymphaea odorata* Ait. In fresh-water ponds (artificial), area #2.
- Cakile edentula* (Bigel.) Hook. Beach, area #1.
- Lepidium virginicum* L. Along edge of brackish ponds, higher ground at edge of bayberry thickets, area #1.
- Drosera rotundifolia* L. Sphagnum-cranberry bogs between dunes. Area #2.
- Amelanchier laevis* Wieg. Common in thickets in center of island. Areas #2 and #3.
- Potentilla egedei* Wormsk. var. *groenlandica* (Tratt.) Polunin. Fairly common in *Juncus gerardi* zone of salt marsh, area #3.
- Prunus maritima* Marsh. A common component of thickets in center of the island and around fresh-water and brackish water ponds. Areas #1, #2, and #3.
- Prunus persica* (L.) Batsch. In a hedge, along side abandoned house at lighthouse, area #2.
- Prunus serotina* Ehrh. Part of dune thickets, center of island. Areas #2 and #3.
- Pyrus arbutifolia* (L.) L.f. Thickets in center of island and around fresh-water marsh. Areas #2 and #3.
- Rosa carolina* L. Thickets along road in dunes, area #3.
- Rosa nitida* Willd. Roadside and dune, area #3.
- Rosa rugosa* Thunb. Dunes and thickets. Areas #1 and #2.
- Rubus hispidus* L. Trailing in path through thickets around fresh-water marsh.
- Rubus idaeus* L. var. *strigosus* (Michx.) Maxim. Thickets along roadsides and dunes. With *Rhus radicans*. Fruits. Area #3.



- Spiraea tomentosa* L. Edge of sphagnum-cranberry bog. Area #2.
- Lathyrus japonicus* Willd. Part of beach vegetation and frontal dunes. Very common. Areas #1, #2, & #3.
- Euphorbia polygonifolia* L. Plants on beach, smaller ones in dunes. Area #1.
- Rhus radicans* L. Very common. In thickets, back of dunes. Areas #1, #2, and #3.
- Ilex verticillata* (L.) Gray. Thickets, tops of dunes in center of island, area #3.
- Hypericum boreale* (Britt.) Bickn. Dry area between fresh-water marsh and dunes, area #1.
- Hypericum virginicum* L. Wet area between dunes, area #2. Fresh-water marsh at Inward Point, area #3.
- Hudsonia tomentosa* Nutt. Very common on secondary dunes. All areas.
- Lechea maritima* Leggett. Scattered over dunes in area #3.
- Viola lanceolata* L. Sphagnum-cranberry bog in hollow of dunes. Area #2.
- Ludwigia palustris* (L.) Ell. var. *americana* (DC) Fern. & Griseb. Very abundant in fresh-water marsh, area #1.
- Daucus carota* L. Weedy area around old lighthouse station, area #2.
- Ptilimnium capillaceum* (Michx.) Raf. Wet areas near brackish and fresh-water marshes and ponds, areas #1 and #2.
- Lyonia ligustrina* (L.) DC. Part of thickets around fresh-water marsh, area #3.
- Vaccinium angustifolium* Ait. var. *nigrum* (Wood) Dole. Thickets on dune top, center of island, area #3.
- Vaccinium corymbosum* L. Thickets around fresh-water marsh. Fruit abundant 1965, none in 1966 and 1967, area #3.
- Vaccinium macrocarpon* Ait. Small plant in wet swale in area #1. Abundant in several bogs in hollow of dunes, area #2.
- Trientalis borealis* Raf. Sandy soil, in path and under thickets around fresh-water marsh. Area #3.



- Limonium carolinianum* (Walt.) Britton. Bare areas and in *Spartina patens* zone of salt marsh. Area #3.
- Lycopus americanus* L. Wet area around brackish ponds. Area #1.
- Scutellaria epilobiifolia* Hamilton. Common around edges of artificial fresh-water ponds. Area #2.
- Teucrium canadense* L. Common around artificial fresh-water ponds. Area #2.
- Linaria canadensis* (L.) Dumont. Sandy soil on dunes. Flowering over and seed formed. Area #3.
- Linaria vulgaris* Hill. Depression in dunes near west shore. Not blooming. Area #3.
- Verbascum thapsus* L. Edge of a depression near fresh-water ponds. Area #1.
- Plantago oliganthos* R. & S. Bare area in salt marsh. Area #3.
- Galium palustre* L. Wet area near brackish ponds. Very common. Area #1.
- Viburnum dentatum* L. Thickets around fresh-water marsh. Area #3.
- Achillea millefolium* L. Weedy area around old lighthouse, area #2.
- Artemisia caudata* Michx. Common on dunes. Better developed in center of island. Areas #1 and #2.
- Artemisia stelleriana* Bess. Beach vegetation. Area #1.
- Aster* sp. Near old lighthouse. Area #2.
- Baccharis halimifolia* L. Low dunes and high part of salt marsh. Area #3.
- Chrysopsis falcata* (Pursh.) Ell. Very common on dunes in all areas. In 1965 attacked and defoliated by caterpillars.
- Cirsium vulgare* (Savi) Tenore. Edge of bayberry thickets near brackish ponds, area #1.
- Erichtites hieraceifolia* (L.) Raf. Weedy area around old lighthouse. Wet area. Area #2.
- Gnaphalium obtusifolium* L. Between dunes and brackish ponds. Area #1.



*Pluchea purpurascens* (Sw.) DC. var. *succulenta* Fern.  
Swale at border of brackish water ponds in *Typha*  
marsh, area #1.

*Solidago sempervirens* L. Beach and dunes. Areas #1, #2,  
and #3.

*Solidago tenuifolia* Pursh. Between dunes and near fresh-  
water ponds, area #2. Between dunes and salt marsh,  
area #3.

*Sonchus asper* (L.) Hill. Edge of pond and thickets. Area  
#1.

*Xanthium echinatum* Murr. Beach and dunes. Areas #2  
and #3.

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